



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/670,765

09/25/2003

James A. Greer

27524-002

2783

30623

7590

04/13/2006

MINTZ, LEVIN, COHN, FERRIS, GLOVSKY
AND POPEO, P.C.
ONE FINANCIAL CENTER
BOSTON, MA 02111

EXAMINER

ELVE, MARIA ALEXANDRA

ART UNIT

PAPER NUMBER

1725

DATE MAILED: 04/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/670,765	GREER ET AL.	
	Examiner	Art Unit	
	M. Alexandra Elve	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). * In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moto et al. (US Pat. 5,672,210) in view of Radhakrishnan (US Pat. 6,024,851).

Moto et al. discloses a deposition system using laser ablation. A target in the chamber may be rotated and scanned, generating a plume for final deposition on to a substrate. A mirror scanning system is made up of a plurality of mirrors, which are capable of moving in order to alter the optical path of the laser beam, that is, X and Y motion. Servomotors control the mirror scan system. The target may be rotated about an axis perpendicular to the exposed target surface and the laser beam is arranged to be incident on the surface of the target which is in turn dependent on the mirror scan system. The substrate holder may have an X-Y stage and/or a rotation stage in order for the substrate to move during the laser ablation process and thus contact the apex of the plume during deposition. (abstract, figures, col. 2, lines 1-29, col. 3, lines 13-47, col. 4, lines 34-67, col. 5, lines 1-2, 40-54)

Moto et al. does not teach the use of an X-Y table for the target or the angle of the target (platform).

Radhakrishnan teaches a system for pulsed laser deposition of thin films. The target is rotated by a target holder, while being exposed to the pulsed laser beam, for uniform ablation. The target holder may be positioned at a forty-five degree angle with respect to the incoming laser beam. (abstract, figures, col. 5, lines 47-55) It would have been obvious to one of ordinary skill in the art at the time of the invention to angle the target, as taught by Radhakrishnan, in the Moto system because it would generate a more uniform plume and hence a more uniform deposition.

Motor et al. does teach the use of an X-Y table for the substrate. It would be obvious to one of ordinary skill in the art at the time of the invention to use an X-Y table for the target because this would give more flexibility to the deposition system and hence enhance the quality and optimize the substrate deposition.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moto et al. in view of Radhakrishnan, as stated in the above paragraph and further in view of Tamanyan et al. (US Pub. 2004/0033702 A1).

Moto et al. and Radhakrishnan does not teach a linear scan across the target. Tamanyan et al. teaches the deposition of a thin film onto a substrate. The target is cylindrical and rotates about its longitudinal axis, which extends normal to the axis, which extends normal to the axis of incident laser beam. Rotation of the target avoids successive laser pulses striking the same spot on the target (eliminating crater formation). The laser beam or target may additionally or alternatively be scanned in the plane perpendicular (linear passes) to the axis of the laser beam to avoid crater

Art Unit: 1725

formation. (abstract, figures, 0051) It would have been obvious to one of ordinary skill in the art at the time of the invention to scan the target in a linear fashion, as taught by Tamanyan et al., in the Moto et al. and Radhakrishnan system because the target would be fully utilized.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Moto et al. in view of Radhakrishnan, and further in view of Tamanyan et al.

Moto et al. discloses a deposition system using laser ablation. A target in the chamber may be rotated and scanned, generating a plume for final deposition on to a substrate. A mirror scanning system is made up of a plurality of mirrors, which are capable of moving in order to alter the optical path of the laser beam, that is, X and Y motion. Servomotors control the mirror scan system. The target may be rotated about an axis perpendicular to the exposed target surface and the laser beam is arranged to be incident on the surface of the target which is in turn dependent on the mirror scan system. The substrate holder may have an X-Y stage and/or a rotation stage in order for the substrate to move during the laser ablation process and thus contact the apex of the plume during deposition. (abstract, figures, col. 2, lines 1-29, col. 3, lines 13-47, col. 4, lines 34-67, col. 5, lines 1-2, 40-54)

Moto et al. does not teach the use of an X-Y table for the target, the angle of the target (platform) or the use of software to generate operational commands.

Radhakrishnan teaches a system for pulsed laser deposition of thin films. The target is rotated by a target holder, while being exposed to the pulsed laser beam, for

Art Unit: 1725

uniform ablation. The target holder may be positioned at a forty-five degree angle with respect to the incoming laser beam. (abstract, figures, col. 5, lines 47-55) It would have been obvious to one of ordinary skill in the art at the time of the invention to angle the target, as taught by Radhakrishnan, in the Moto system because it would generate a more uniform plume and hence a more uniform deposition.

Motor et al. does teach the use of an X-Y table for the substrate. It would be obvious to one of ordinary skill in the art at the time of the invention to use an X-Y table for the target because this would give more flexibility to the deposition system and hence enhance the quality and optimize the substrate deposition.

The provision of mechanical or automated means to replace manual activity was held to have been obvious. In re Venner 120 USPQ 192.

Response to Arguments

Applicant's arguments filed 1/27/06 have been fully considered but they are not persuasive. Applicant argues that Moto et al. does not teach directing the laser across the target and then rotating. The examiner respectfully disagrees because a target in the chamber may be rotated and scanned with respect to the laser.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Alexandra Elve whose telephone number is 571-272-1173. The examiner can normally be reached on 6:30-3:00 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1725

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 11, 2006.

A handwritten signature in black ink, appearing to read 'M. Elve', with a long horizontal flourish extending to the right.

M. Alexandra Elve
Primary Examiner 1725